Professional Agricultural Workers Journal

Volume 4
Number 1 *Professional Agricultural Workers Journal*

11

10-31-2016

Assessing Florida Consumer Attitudes and Beliefs about Locally or Regionally Produced Livestock and Products

Akua Adu-Gyamfi
Tuskegee University, aadu-gyamfi@mytu.tuskegee.edu

Reem I. Omer
Tuskegee University

Jannette R. Bartlett
Tuskegee University

David Nii O. Tackie
Tuskegee University, dtackie@mytu.tuskegee.edu

Bridget J. Perry
Tuskegee University

ASSESSING FLORIDA CONSUMER ATTITUDES AND BELIEFS ABOUT LOCALLY OR REGIONALLY PRODUCED LIVESTOCK AND PRODUCTS

***Akua Adu-Gyamfi[1], Reem I. Omer[1], Jannette R. Bartlett[1], **David Nii O. Tackie[1], and Bridget J. Perry[1]**

[1]Tuskegee University, Tuskegee, AL

***Email of lead author: aadu-gyamfi@mytu.tuskegee.edu**

****Email of corresponding author: dtackie@mytu.tuskegee.edu**

Abstract

In recent years, consumer interest in locally or regionally produced foods has been growing. This study analyzed consumer attitudes and beliefs on local or regional livestock products in Florida. Data were collected from a convenience sample of 404 participants from counties in Florida. They were assessed by descriptive statistics, including chi-square tests. Most participants believed using chemicals in locally or regionally produced beef or goat meat was at minimum a somewhat serious hazard. Thus, many were willing to pay more for meat certified as locally or regionally produced. Moreover, most agreed or strongly agreed with statements on meat attributes. Chi-square tests showed that race/ethnicity, age, education, and household income had significant effects on willingness to pay more for meat certified as locally or regionally produced. Also, safety, no difference, availability, affordability, quality, desirability, and hygiene had significant effects on willingness to pay more for meat certified as locally or regionally produced.

Keywords: Consumers, Attitudes and Beliefs, Local and Regional, Willingness to Pay, Livestock Products

Introduction

According to La Trobe and Acott (2000) consumers have become concerned about food production practices and food supply chain because the distance between production points and consumption points have become larger. Ilbery et al. (2005) explained that as a result of this, many consumers have added locally produced food; that is, food that has travelled short distances to their "food baskets." Taylor (2008) further explained that reduced transport time between production points and consumption points creates low chances for spoilage and less need for preservatives. In addition, he emphasized that fewer agricultural chemicals and antibiotics are used in the production of local foods.

Adams and Salois (2010) also mentioned that the need for more transparency in the food supply chain has become necessary because of the increasingly intertwined global food chains and the many news reports about food scandals around the world. Cleveland et al. (2014) argued that one way to ameliorate the problem associated with the current food system is to emphasize social sustainability, which is tied to the local food system. The local food system encourages or promotes farmers and local customers through community supported agriculture, farm stands, U-pick operations or farmers markets.

Feldmann and Hamm (2014) stated that the interest in local food has steadily increased in the past fifteen years. Guptill and Wilkins (2002) contended that this has been possible because of the work of movements such as the environmental movement, the community food security movement, the slow movement, and the local food movement, which are all part of the drive towards local foods. In fact, Zepeda and Deal (2009) opined that some consumers regard locally produced foods as a more environmentally and climate friendly alternative to conventional foods, while others view it as fresher, safer, and healthier alternative to conventional foods. Adalja et al. (2013) also emphasized that consumers usually prefer locally produced foods, because of the perception of freshness, healthiness, as well as the implied support for small farms and the local economy.

Additionally, Engel et al. (1995) explained that attributes such as flavor, color, smell, country of origin, brand, and price could affect food purchasing decisions. According to Schnettler et al. (2008), quality is one of the most important attributes that affect consumer meat purchasing decisions. Schröeder and McEachern (2004), for example, found that consumers avoid buying meat produced in intensive systems if the production method affected the quality of the meat. Zepeda and Deal (2009) also concluded that meat attributes affect consumers' purchasing decisions and willingness to pay a premium in local foods systems. What's more (Frewer et al., 2005), maintained that in livestock production, in general, consumers are concerned about livestock treatment, animal welfare, impact of production processes on the environment, and food safety issues and their impact on human health.

In the light of the concerns for food production practices and local food production as well as attributes of meat, it is worthwhile to evaluate the attitudes and beliefs about livestock and livestock products, especially in the Southeast where limited research has been conducted on the subject. Consequently, the purpose of this study was to assess Florida consumer attitudes and beliefs about locally or regionally produced livestock and products. Specific objectives were to (1) describe socioeconomic factors, (2) describe and analyze attitudes and beliefs about chemicals in beef or goat meat, (3) describe attitudes and beliefs about selected attributes of beef or goat meat, and (4) assess relationships between both socioeconomic factors and meat attributes with willingness to pay more for beef or goat meat certified as locally or regionally produced.

Literature Review

This review of the literature briefly describes previous research, using a step-by-step approach. It focuses on three key areas, and these are; perceptions about production methods, perceptions on product attributes, and willingness to pay more for specific meat products.

Perceptions about Production Methods

The Food Marketing Institute (1996) analyzed consumer concerns and attitudes regarding chemicals in meat. The results showed that 66% of the respondents considered pesticide residues/insecticides/herbicides in meat as a serious risk, followed by 42% who considered antibiotics and hormones in meat a serious risk to health.

Miles et al. (2004) evaluated public worry about food safety issues. They found that of the 18 most problematic issues, the use of hormones was of most concern, followed by the use of

antibiotics, use of pesticides, animal welfare, genetically modified foods, safety, additives in food (e.g., colorings, preservatives), quality, conflicting information, lack of information, and hygiene.

Hwang et al. (2005) examined consumers' concerns about food production and processing technologies. Out of eight technologies examined, the use of pesticide and artificial growth hormones generated the most concern; followed by antibiotics, genetic modification and irradiation which raised intermediate levels of concern for consumers. Pasteurization, artificial colors and flavors generated the least concerns for consumers.

Martinez (2008) estimated the value of retail beef product brands and other attributes. The author found that beef products that received the largest premiums were branded beef with specific production requirements, containing natural, organic, source verified, grass-fed, and breed-specific.

Brooks and Ellison (2014) assessed livestock production methods that matter most to consumers. The results showed that no growth hormones, no genetically-modified organisms, and humanely raised were the production methods that mattered most to beef consumers.

Tackie et al. (2015) analyzed Alabama consumer attitudes and beliefs about locally or regionally produced livestock and products. They found that at least 66% of the participants agreed that buying locally or regionally produced beef or goat meat was safer compared to buying similar non-locally or regionally produced beef or goat meat. Also, 87% were of the opinion that residues from pesticides in beef or goat meat produced and sold locally or regionally were at minimum a somewhat serious hazard. Identical percentages for antibiotics, growth hormones, artificial fertilizers, additives and preservatives, and artificial coloring were, respectively, 85%, 90%, 85%, 82%, and 79%.

Perceptions on Product Attributes

Caswell (1998) evaluated how labeling of safety and process attributes affects markets for food. The results showed that consumers will purchase products that will give them the maximum utility, as long as they are able to approximately judge the quality attributes. The author surmised that certification labeling allows consumers to better judge attributes that they care about.

Loureiro and Umberger (2006) examined preferences for food safety, country-of-origin labeling, and traceability. The authors found that food safety certification attribute was the most important followed by labels indicating the country of origin, traceability, and tenderness.

Lee et al. (2013) assessed Korean consumers' valuation for BSE-tested and country of origin labeled beef products. Again, it was reported that the food safety attribute was the most important, followed by traceability. These consumers' mostly preferred domestic beef over imported beef, and for imported beef, they preferred beef from a country that had not experienced BSE outbreak relative to a country that had experienced a BSE outbreak.

Short-McKendree and Widmar (2013) analyzed consumer perceptions of livestock products and animal welfare. The results showed that participants were most concerned about food safety standards (69%), followed by animal welfare standards (52%).

Tackie et al. (2015) examined Alabama consumer attitudes and beliefs about locally or regionally produced livestock and products. The results indicated that at least 67% of the participants agreed that locally or regionally produced beef or goat meat is safe to consume (safety); identical percentages for "no difference between the safety of locally produced beef or goat meat and non-locally produced " (affordability); "if they would buy locally produced beef or goat meat if it were of equal quality compared to its opposite;" (quality) "if they would buy locally produced beef or goat meat if it were of equal desirability compared to its opposite" (desirability), and "if they would buy locally produced beef or goat meat not worrying about how it was raised if it appeared hygienic and healthy" (hygiene) were, respectively, 40%, 73%, 67%, 68%, 69%, and 47%.

Willingness to Pay More for Product Attributes

Loureiro and Umberger (2006) investigated consumer preferences for food safety, country-of-origin labeling, and traceability. They reported that the food safety attribute had the highest premium of $8.07/1b of steak, followed by country-of-origin label which had a premium of $2.57/1b of steak, traceability which had a premium of about $1.90/1b of steak, and tenderness which had a premium of $0.95/1b of steak.

Schulz et al. (2010) analyzed the value of beef steak branding at retail. They argued that beef steaks with brands gain more premium compared to beef steaks with no brands. Also, they argued that characteristics of beef steak, such as breed claim, organic claim, religious processing claim, and cut can affect the premium of the beef steak. The authors found that branded beef steak had a premium of $5.81/lb compared to unbranded beef steak, which had a price of $1.32/lb. In addition, beef steak with breed claim had $1.15/lb lower price on average than product without a breed claim, an unexpected finding. Religious processing claims had, on average, a premium of $0.79/lb higher relative to a product without religious claim. Organic claim had a premium of $1.43/lb higher relative to non-organic beef steak products.

Gwin and Lev (2011) assessed meat and poultry buying at farmers markets in Oregon. They found that 86% of respondents were willing to pay more for local meat and poultry at the farmers markets. Generally, two-thirds of respondents were willing to pay at least a 25% premium.

Mathews and Johnson (2013) examined alternative beef production systems focusing on the logic behind the premiums. They found that consumers were willing to pay more for taste, appearance, and nutritional preferences.

Adalja et al. (2013) analyzed consumer willingness to pay for local products. They reported that consumers were willing to pay premiums of $0.82 and $1.47 for grass-fed and local attributes, respectively.

Lee et al. (2013) analyzed Korean consumers' valuation for BSE-tested and country of origin labeled beef products. The results indicated that respondents were willing to pay $18.06/kg more on the BSE-tested labeled US beef than on US beef without BSE-tested label.
Tackie et al. (2015) also investigated Alabama consumer attitudes and beliefs about locally or regionally produced livestock and products. The authors reported that 24% indicated that they would not pay more for their favorite beef, goat meat, or related product if it were certified as locally or regionally produced. However, 75% were willing to pay more for similar products, with 47% willing to pay 1-5 cents more per pound.

Methodology

Data Collection

A questionnaire was created with some questions adopted, with permission, from Govindasamy et al. (1998) to generate the data for the study. It had two key sections, particularly, attitudes and beliefs, and demographic information. Before being administered, the questionnaire was submitted to the Institutional Review Board for approval. The questionnaire was administered to a convenience sample of participants. This method was used because of a lack of a known sampling frame from which participants could be selected.

In the summer of 2013 through the summer of 2015, data were gathered by using self-administered means in several counties of Florida (Alachua, Broward, Calhoun, Franklin, Gadsden, Hardee, Jefferson, Leon, Madison, Orange, Polk, Taylor, and Wakulla). Extension agents in the various counties, other technical personnel from Florida A&M University, as well as a graduate student from Alabama helped with collecting the data. The final sample comprised 404 participants, and this was considered adequate for analysis.

Data Analysis

The data were analyzed by using descriptive statistics, specifically, frequencies, percentages, and chi square tests. The chi-square description is adapted from Tackie et al. (2015). The chi-square test allows the researcher to develop a null hypothesis (Ho), that indicates that two variables are independent of (or not related to) each other, and an alternative hypothesis (Ha), that indicates that two variables not independent of (or related to) each other. The null hypothesis and alternative hypothesis are stated generally on the basis of the test of independence for two sets of variables, for instance, as:

Ho: Willingness to pay more for beef or goat meat certified as locally or regionally produced is independent of (or not related to) selected socioeconomic variables.
Ha: Willingness to pay more for beef or goat meat certified as locally or regionally produced is not independent of (or is related to) selected socioeconomic variables.

To determine the chi-square, χ^2, the formula below is used:

$$\chi^2 = \sum_{i=1}^{r}\sum_{j=1}^{c} \frac{(fo_{i,j}-fe_{i,j})^2}{fe_{i,j}}$$

Where
χ^2 = chi-square
fo = observed frequency
fe = expected frequency
i,j = values in the i^{th} row and j^{th} column, respectively
$\sum$ = summation

The observed frequency is the frequency derived from the survey, and the expected frequency is estimated from each cell in a contingency table as the product of the row total and the column total divided by the grand total. If the chi-square is significant, then the null hypothesis that the two variables are independent of each other is rejected; otherwise, it is not rejected. In this study, hypotheses were stated for willingness to purchase beef or goat meat certified as locally or regionally produced and socioeconomic factors. In the case of education, for example, the hypotheses were stated as:

Ho: Willingness to pay more for beef or goat meat certified as locally or regionally produced is independent of the educational level of respondents.
Ha: Willingness to pay more for beef or goat meat certified as locally or regionally produced is not independent of (or related to) the educational level of respondents.

Similar hypotheses were stated for the other socioeconomic factors: household size, gender, race/ethnicity, age, annual household income, and marital status. Identical hypotheses were stated for willingness to pay more for beef or goat meat certified as locally or regionally produced and meat attributes or variables. The data were entered into SPSS 12.0© (MapInfo Corporation, Troy, NY), and frequencies and percentages were generated. Chi-square tests were conducted to ascertain relationships.

Results and Discussion

Table 1 reflects the socioeconomic characteristics of the respondents. Nearly 82% had a household size of 1-3, and 17% had a household size of 4-6. The mean number of persons in the household was two (not shown in Table). About 80% of respondents were the primary shoppers of food in their households; approximately 74% were females. Focusing on race/ethnicity and age, 28% were Blacks and 67% were Whites; also, 27% were, at most, 44 years and 72% were over 44 years of age. Furthermore, considering education and annual household income, 37% had at most a two-year/technical degree or some college education, and 63% had a college education; 19% earned $30,000 or less annual household income and 70% earned over $30,000 as annual household income, including 32% that earned $30,000-$60,000. About 40% were singles, and 58% were married. The respondents generally included many more females than males, many more Whites compared to Blacks, a higher proportion of middle-aged or older persons relative to younger persons, with a good educational level, with moderate to fairly high household incomes, and a higher proportion of married compared to single persons.

Table 1. Socioeconomic Characteristics (N = 404)

Variable	Frequency	Percent
Number of Persons in Household		
1-3	332	82.2
4-6	67	16.6
7-9	0	0.0
10 or more	0	0.0
No Response	5	1.2
Primary Shopper of Food		
Yes	324	80.2
No	77	19.1
No Response	3	0.7
Gender		
Male	104	25.7
Female	300	74.0
Race/Ethnicity		
Black	113	28.0
White	271	67.1
Other	18	4.5
No Response	2	0.5
Age		
20-24 years	8	2.0
25-34 years	53	13.1
35-44 years	47	11.6
45-54 years	62	15.3
55-64 years	136	33.7
65 years or older	93	23.0
No Response	5	1.2
Educational Level		
High School Graduate or Below	32	7.9
Two-Year/Technical Degree	38	9.4
Some College	78	19.3
College Degree	129	31.9
Post-Graduate/Professional Degree	124	30.7
No Response	3	0.7

Table 2 depicts attitudes and beliefs about using chemicals and additives, and willingness to pay for certified locally or regionally produced beef or goat meat. About 63% of respondents agreed or strongly agreed that buying locally or regionally produced beef or goat meat is safer than buying similar products produced non-locally or regionally. Nearly 91% indicated that residues from pesticides in beef or goat meat produced and sold locally or regionally is a serious or

Table 1. Continued

Variable	Frequency	Percent
Annual Household Income		
$10,000 or less	14	3.5
$10,001-20,000	32	7.9
$20,001-30,000	30	7.4
$30,001-40,000	43	10.6
$40,001-50,000	39	9.7
$50,001-60,000	49	12.1
$60,001-70,000	62	15.3
Over $70,000	88	21.8
No Response	47	11.6
Marital Status		
Single, never married	67	16.6
Married	235	58.2
Separated	11	2.7
Divorced	59	14.6
Widowed	24	5.9
No Response	8	2.0

somewhat serious hazard. Approximately 90% of respondents indicated that residues from antibiotics in beef or goat meat produced and sold locally or regionally is a serious or somewhat serious hazard. Nearly 92% stated that growth stimulants or hormones in beef or goat meat produced and sold locally or regionally is a serious or somewhat serious hazard. About 88% stated that artificial fertilizers in pastures used to raise beef cattle or meat goats produced and sold locally or regionally is a serious or somewhat serious hazard. Almost 88% indicated that using additives and preservatives in beef or goat meat produced and sold locally or regionally is a serious or somewhat serious hazard. Approximately 79% indicated that using artificial coloring in beef or goat meat produced and sold locally or regionally is a serious or somewhat serious hazard.

On the whole, 79% were of the view that the use of chemicals in locally or regionally produced and sold beef or goat meat is a serious or somewhat serious hazard. The findings are similar to those obtained by Miles et al. (2004), Hwang et al. (2005), and Tackie et al. (2015) who found that consumers were concerned about chemicals in food or meat products.

Approximately 13% indicated they would not pay more for their favorite beef, goat meat, or related product if it were certified as locally or regionally produced. However, nearly 85% indicated they were willing to pay more for their favorite beef, goat meat, or related product if it were certified as locally or regionally produced. The spread went mostly to the first two groupings; 20% indicated they would pay between 1-5 cents more; and nearly 30% indicated

Table 2. Attitudes and Beliefs about Using Chemicals, Additives, and Willingness to Pay for Locally or Regionally Produced Beef or Goat Meat (N = 404)

Variable	Frequency	Percent
Purchasing Locally or Regionally Produced Beef Cattle, Meat Goat, and Product is Safer		
Strongly Agree	91	22.5
Agree	164	40.6
Neutral	103	25.5
Disagree	24	5.9
Strongly Disagree	4	1.0
No Response	18	4.5
Residues from Pesticides		
Serious Hazard	164	40.6
Somewhat of a Serious Hazard	202	50.0
Not at all a Hazard	37	9.2
No Response	1	0.2
Antibiotics		
Serious Hazard	147	36.4
Somewhat of a Serious Hazard	218	54.0
Not at all a Hazard	37	9.2
No Response	2	0.5
Growth Stimulants or Hormones		
Serious Hazard	202	50.0
Somewhat of a Serious Hazard	169	41.8
Not at all a Hazard	33	8.2
Artificial Fertilizers in Pastures		
Serious Hazard	125	30.9
Somewhat of a Serious Hazard	229	56.7
Not at all a Hazard	49	12.1
No Response	1	0.2
Additives and Preservatives		
Serious Hazard	123	30.4
Somewhat of a Serious Hazard	234	57.9
Not at all a Hazard	47	11.6

they would pay between 6-10 cents more. In effect, 50% were willing to pay between 1-10 cents more; but, as the increases in price went beyond 10 cents, the percentages generally dropped (Table 2). This distribution gives an idea of the premium placed on the product. The findings are in agreement with those of Loureiro and Umberger (2006), Schulz et al. (2010), Gwin and Lev (2011), Adalja et al. (2013), and Tackie et al (2015) who reported that consumers were willing to

Table 2. Continued

Variable	Frequency	Percent
Artificial Coloring		
Serious Hazard	107	26.5
Somewhat of a Serious Hazard	213	52.7
Not at all a Hazard	83	20.5
No Response	1	0.2
Willingness to Pay More		
No	53	13.1
Yes, between 1 and 5 cents more	81	20.0
Yes, between 6 and 10 cents more	120	29.7
Yes, between 11 and 15 cents more	97	24.0
Yes, between 16 and 20 cents more	5	1.2
Yes, over 20 cents more	39	9.7
No Response	9	2.2
Frequency of Purchasing Locally or Regionally Produced Beef or Goat Meat		
Always	11	2.7
Very Often	34	8.4
Often	84	20.8
Quite Often	79	19.6
Not At All	175	43.3
No Response	21	5.2

pay more for preferred meat attributes. Furthermore, nearly 52% indicated that they purchased locally or regionally produced beef or goat meat, at least, quite often, including 11% stating very often and always (Table 2). Some loyalty is implied in purchasing locally or regionally produced beef or goat meat; a positive development for the local or regional economy.

Table 3 reflects attitudes and beliefs about selected attributes of locally or regionally produced beef or goat meat. About 61% agreed or strongly agreed that locally or regionally produced beef or goat meat is generally safe to consume (safety); 21% agreed or strongly agreed that there is no difference between the safety of locally or regionally produced beef or goat meat and non-locally or regionally produced beef or goat meat (no difference); 73% agreed or strongly agreed that they would buy locally or regionally produced beef or goat meat if it were more readily available (availability); 66% agreed or strongly agreed that they would buy locally or regionally produced beef or goat meat if it were cheaper (affordability). Moreover, about 68% agreed or strongly agreed that they would buy locally or regionally produced beef or goat meat if it were of equal quality [taste and appearance] as non-locally or regionally produced beef or goat meat (quality); 68% agreed or strongly agreed that they would buy locally or regionally produced beef or goat meat if it were of equal desirability [appearance and smell] as non-locally or regionally produced beef or goat meat (desirability); 32% agreed or strongly agreed that they would buy locally or

regionally produced beef or goat meat not worrying about how it was raised if it appeared hygienic and wholesome (hygiene).

Table 3. Attitudes and Beliefs about Selected Attributes of Locally or Regionally Produced Beef or Goat Meat (N = 404)

Variable	Frequency	Percent
Locally or Regionally Produced Beef or Goat Meat is Generally Safe to Consume		
Strongly Agree	60	14.9
Agree	185	45.8
Neutral	133	32.9
Disagree	19	4.7
Strongly Disagree	0	0.0
No Response	7	1.7
No Difference between Safety of Locally or Regionally Produced Beef or Goat Meat and Non-Locally or Regionally Produced Beef or Goat Meat		
Strongly Agree	17	4.2
Agree	68	16.8
Neutral	145	35.9
Disagree	129	31.9
Strongly Disagree	35	8.7
No Response	10	2.5
Would Buy Locally or Regionally Produced Beef or Goat Meat if More Readily Available		
Strongly Agree	84	20.8
Agree	212	52.5
Neutral	88	21.8
Disagree	10	2.5
Strongly Disagree	3	0.7
No Response	7	1.7
Would Buy Locally or Regionally Produced Beef or Goat Meat if Cheaper		
Strongly Agree	106	26.2
Agree	159	39.4
Neutral	112	27.7
Disagree	18	4.5
Strongly Disagree	7	1.7
No Response	2	0.5

Table 3. Continued

Variable	Frequency	Percent
Would Buy Locally or Regionally Produced Beef or Goat Meat if of Equal Quality as Non-Locally or Regionally Produced Beef or Goat Meat		
Strongly Agree	103	25.5
Agree	171	42.3
Neutral	104	25.7
Disagree	14	3.5
Strongly Disagree	7	1.7
No Response	5	1.2
Would Buy Locally or Regionally Produced Beef or Goat Meat if of Equal Desirability as Non-Locally or Regionally Produced Beef or Goat Meat		
Strongly Agree	94	23.3
Agree	181	44.8
Neutral	99	24.5
Disagree	19	4.7
Strongly Disagree	7	1.7
No Response	4	1.0
Would Buy Locally or Regionally Produced Beef or Goat Meat not Worrying about how Raised if it Appeared Hygienic or Wholesome		
Strongly Agree	26	6.4
Agree	104	25.7
Neutral	90	22.3
Disagree	120	29.7
Strongly Disagree	58	14.4
No Response	6	1.5

Overall, at least, 61% agreed or strongly agreed with statements on the selected attributes, with the exception of “no difference in safety” and “hygiene” attributes with only 21% and 32%, respectively, agreeing or strongly agreeing. This implies that respondents see differences in terms of safety between locally or regionally produced beef or goat meat and non-locally or regionally produced beef or goat meat. Put it another way, if they had their way they might purchase locally or regionally produced beef or goat meat rather than non-locally or regionally produced beef or goat meat. What’s more, the response to the hygiene statement appears to buttress the responses on attitudes and beliefs about chemicals, where most, at least 79%, agreed

or strongly agreed with statements. These results support Tackie et al. (2015) who detected similar trends in attribute preference.

Table 4 depicts the chi-square test results between willingness to pay more for beef or goat meat certified as locally or regionally produced and socioeconomic variables. Race/ethnicity, age, education, and household income were significant, respectively, $p = 0.000$, $p = 0.030$, $p = 0.098$, and $p = 0.031$. This means that race/ethnicity, age, education, and household income are not independent of willingness to pay more for beef or goat meat certified as locally or regionally produced; the null hypotheses are rejected. For race/ethnicity, it probably implies that Whites more than Blacks were willing to pay more for beef or goat meat certified as locally or regionally produced. For age, it could mean that older persons were more willing to pay more for beef or goat meat certified as locally or regionally produced than younger persons. For education, it could mean that those with more education are more willing to pay more for beef or goat meat certified as locally or regionally produced. For household income, it could mean that the higher the household income the more willing one is to pay more for beef or goat meat certified as locally or regionally produced. Household size, gender, and marital status did not influence willingness to pay. The null hypotheses that these variables are independent of willingness to pay more for beef or goat meat certified as locally or regionally produced are not rejected. These findings are in partial agreement with Tackie et al. (2015) who found gender, education, and household income significant.

Table 4. Chi-Square Tests between Socioeconomic Variables and Willingness to Pay More for Beef or Goat Meat Certified as Locally or Regionally Produced

Variable	df	χ^2	*p* value
Household size	10	7.748	0.653
Gender	5	7.146	0.210
Race/Ethnicity	10	36.984***	0.000
Age	25	39.886**	0.030
Education	20	28.512*	0.098
Household Income	35	52.112**	0.031
Marital Status	20	22.963	0.291

***Significant at 1%; **Significant at 5%; *Significant at 10%

Table 5 shows the chi-square test results between willingness to pay more for beef or goat meat certified as locally or regionally produced and meat attributes or variables. Safety, no difference, availability, affordability, quality, desirability, and hygiene were significant, respectively, $p = 0.000$, $p = 0.001$, $p = 0.000$, $p = 0.000$, $p = 0.000$, $p = 0.000$, and $p = 0.015$. In other words, all the attributes were significant. This implies that safety; no difference; availability; affordability; quality; desirability, and hygiene are not independent of willingness to pay more for beef or goat meat certified as locally or regionally produced; the null hypotheses are rejected. Considering safety, it may mean that respondents perceive beef or goat meat certified as locally or regionally produced generally safe to consume, therefore, they are willing to pay more for such meat.

Similarly, for no difference, it may mean that as respondents perceive that there is a difference between safety of beef or goat meat certified as locally or regionally produced and the safety of non-locally or regionally produced beef or goat meat, and therefore, they are willing to pay more for the former and support the local economy. In the case of availability, it may mean that as respondents perceive the availability of beef or goat meat certified as locally or regionally produced, they may have a strong incentive to purchase such meat, probably on the basis of loyalty to the local economy.

Considering affordability, it probably implies that respondents would be willing to pay more for beef or goat meat certified locally or regionally produced if they perceive it to be affordable. For quality, it may mean that respondents would be willing to pay more for beef or goat meat certified as locally or regionally produced if they perceive it to be of equal quality as non-locally or regionally produced beef or goat meat. Moreover, for desirability, it may mean that respondents would be willing to pay more for beef or goat meat certified as locally or regionally produced if they perceive it to be of equal desirability as non-locally or regionally produced beef or goat meat. For hygiene, it could mean that respondents would be willing to pay more for beef or goat meat certified as locally or regionally produced not worrying about how the animal was raised if they perceive it to be hygienic and wholesome. These results are in partial agreement with Tackie et al. (2015). They found safety, no difference, affordability, desirability, and hygiene to be significant.

Table 5. Chi-Square Tests between Meat Attributes or Variables and Willingness to Pay More for Beef or Goat Meat Certified as Locally or Regionally Produced

Variable	df	χ^2	*p* value
Safety	15	39.875***	0.000
No Difference	20	46.133***	0.001
Availability	20	86.459***	0.000
Affordability	20	65.254***	0.000
Quality	20	54.321***	0.000
Desirability	20	58.302***	0.000
Hygiene	20	36.180***	0.015

***Significant at 1%

Conclusion

The study assessed Florida consumer attitudes and beliefs about locally or regionally produced livestock and products. Specifically, it identified and described socioeconomic factors; described and assessed attitudes and beliefs about chemicals in beef or goat meat; described and assessed attitudes and beliefs about selected attributes of beef or goat meat; and assessed relationships between socioeconomic factors as well as meat attributes and willingness to pay more for beef or goat meat certified as locally or regionally produced. The socioeconomic factors reflected many more females than males, many more Whites compared to Blacks, a higher proportion of middle-

aged or older persons relative to younger persons, with a good educational level, with moderate to fairly high household incomes, and a higher proportion of married compared to single persons. Most (at least 79%) believed that the use of chemicals in locally or regionally produced and sold beef or goat meat was at least a somewhat serious hazard.

Not surprisingly, 50% were willing to pay 1-10 cents more for their favorite beef, goat meat or related product if it were certified as locally or regionally produced. Also, most (at least 61%), agreed or strongly agreed with the perceptions on selected meat attributes, except in the cases of the no difference in safety and hygiene attributes. The chi-square tests showed that race/ethnicity, age, education, and annual household income had statistically significant relationships with willingness to pay more for beef or goat meat certified as locally or regionally produced. Furthermore, safety, no difference, availability, affordability, quality, desirability, and hygiene had statistically significant relationships with willingness to pay more for beef or goat meat certified as locally or regionally produced.

The results of the study revealed identical trends as in Tackie et al. (2015). Therefore, the conclusion is similar to the one suggested by Tackie et al. It is recommended that the use of lower amounts of chemicals should be stressed in locally or regionally produced livestock or products. In this regard, topics such as sustainable beef cattle and goat management should be incorporated into, or made a part of a local livestock program. Also, since selected meat attributes were generally rated highly (mostly agree or strongly agree), these attributes should matter in local or regional livestock programs.

Furthermore, since race/ethnicity, age, education, and annual household income appear to be important in willingness to pay more for beef or goat meat certified as locally or regionally produced; and safety, no difference, availability, affordability, quality, desirability, and hygiene appear to be important in willingness to pay more for beef or goat meat certified as locally or regionally produced, these factors or attributes should be considered in the production and sale of local or regional beef cattle or meat goat, and/or products in the study area. Future studies involving in-depth statistical analysis should be conducted.

Acknowledgment

This study was funded by USDA National Institute of Food and Agriculture, Agriculture and Food Research Initiative Competitive Grant, Number 2013-68004-20357.

References

Adalja, A., J. Hanson, C. Towe, and E. Tselepidakis. (2013). An Examination of Consumer Willingness to Pay for Local Products, Agricultural and Applied Economics Association 2013 Annual Meeting, Washington, D.C.

Adams, D. C., and M.J. Salois. (2010). "Local Versus Organic: A Turn in Consumer Preferences and Willingness-to-Pay. *Renewable Agriculture and Food Systems* 25: (4): 331-34.

Brooks, K., and B. Ellison. (2014). Which Livestock Production Methods Matter most to Consumers? Paper Presented at the Agricultural and Applied Economics Association's 2014 AAEA Annual Meeting, Minneapolis, Minnesota.

Caswell, J.A. (1998). "How Labeling of Safety and Process Attributes affects Markets for Food." *Agricultural and Resource Economics Review* 27 (2): 151-158.

Cleveland, D.A., N.M. Müller, A.C. Tranovich, D.N. Mazaroli, and K. Hinson. (2014). "Local Food Hubs for Alternative Food Systems: A Case Study from Santa Barbara County, California. *Journal of Rural Studie*s 35: 26-36.

Feldmann, C., and U. Hamm. (2014). "Consumers' Perceptions and Preferences for Local Food." *Food Quality and Preference* 40: 152–164.

Engel, J.S., R. Blackwell, and P. Miniard. (1995). *Consumer Behavior*, 5th ed. Hindsdale, IL: The Dryden Press.

Food Marketing Institute. (1996). Trends in the United States-consumer attitudes and the supermarket. Food Marketing Institute, Washington, D.C.

Frewer, L. J., A. Kole, S.A.A. Van de Kroon, and C. de Lauwere. (2005). "Consumer Attitudes towards the Development of Animal-Friendly Husbandry Systems. *Journal of Agricultural and Environmental Ethics* 18 (4): 345–367.

Govindasamy, R., J. Italia, and J. Rabin, (1998). Consumer Response and Perceptions of Integrated Pest Management Produce. Research Report P-02137-5-98, Department of Agricultural, Food, and Resource Economics and New Jersey Agricultural Experiment Station, Rutgers, The State University of New Jersey, New Bruswick, NJ.

Guptill, A., and J.L. Wilkins. (2002). "Buying into the Food System: Trends in Food Retailing in the U.S. and Implications for Local Food." *Agriculture and Human Values* 19 (1): 39-51.

Gwin, L., and L. Lev. (2011). "Meat and Poultry Buying at Farmers Markets: A Survey of Shoppers at Three Markets in Oregon." Journal of Extension 49 (1): 1-8

Hwang, Y.J., B. Roe, and M.F. Teisl. (2005). "An Empirical Analysis of United States Consumers' Concerns about Eight Food Production and Processing Technologies." *AgBioForum* 8 (1): 40-49.

Ilbery, B., C. Morris, H. Buller, D. Maye, and M. Kneafsey. (2005). "Product, Process, and Place: An Examination of Food Marketing and Labelling Schemes in Europe and North America." *European Urban and Regional Studies* 12 (2): 116-132

La Trobe, H. L., and T.G. Acott. (2000). "Localising the Global Food System." *International Journal of Sustainable Development & World Ecology* 7 (4): 309-320.

Lee, S. H., J.Y. Lee, D.B. Han, and R.M. Nayga. (2013). Assessing Korean Consumers' Valuation for BSE Tested and Country of Origin Labeled Beef Product. Agricultural & Applied Economics Association's 2013 AAEA & CAES Joint Annual Meeting, Washington, DC.

Loureiro, M. L., and W.J. Umberger. (2006). "A Choice Experiment Model for Beef: What US Consumer Responses tell us about Relative Preferences for Food Safety, Country-of-Origin Labeling and traceability." *Journal of Food Policy* 32 (4): 496–514.

Martinez, S.W. (2008). Estimating the Value of Retail Beef Product Brands and other Attributes. Paper presented at the American Agricultural Economics Association Annual Meeting, Orlando, Florida, July 27-29, 2008.

Miles, S., M. Brennan, S. Kuznesof, and N. Mitchell. (2004). "Public Worry about Specific Food Safety." *British Food Journal* 106 (1): 9-22.

Mathews, K. H. Jr., and R.J. Johnson, R.J. (2013). Alternative beef production systems: issues and implications. USDA Economic Research Service. Retrieved October 2, 2015 from http://www.ers.usda.gov

Schnettler, B.M, R.M. Vidal, R.F. Silva, L.C. Vallejos, and N.B. Sepúlveda. (2008). "Consumer Perception of Animal Welfare and Livestock Production in the Araucania Region, Chile." *Chilean Journal of Agricultural Research* 68 (1): 80-93.

Schulz, L. L., T.C. Schroeder, and K. White. (2010). Value of Beef steak Branding: Hedonic Analysis of Retail Scanner Data. Agricultural & Applied Economics Association 2010, AAEA, CAES, & WAEA Joint Annual Meeting, Denver, Colorado, July 25-27, 2010.

Schröeder, M.J.A., and M.G. McEachern. (2004). "Consumer Value Conflicts Surrounding Ethical Food Purchase Decisions: A Focus on Animal Welfare." *International Journal of Consumer Studies* 28 (2): 168-177.

Short-McKendree, M. G., and N.O. Widmar. (2013). Consumer Perceptions of Livestock Products and Animal Welfare. Center for Food and Agricultural Business, Purdue University, West Lafayette, Indiana.

Tackie, N.O., J.R. Bartlett, and A. Adu-Gyamfi. (2015). "Assessing Alabama Consumer Attitudes and Beliefs on Locally or Regionally Produced Livestock and Products." *Professional Agricultural Workers Journal* 2 (2): 1-21.

Taylor, A. D. (2008). "Does One Size Fit All? Small Farms and U.S. Meat Regulations." *Environmental Health Perspective* 116 (12): A529-A531.

Zepeda, L., and D. Deal. (2009). "Organic and Local Food Consumer Behaviour: Alphabet Theory." *International Journal of Consumer Studies* 33 (6): 697-705.